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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,256	05/04/2001	Kazuyuki Misumi	401188	6322

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EXAMINER

THAI, LUAN C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 06/03/2003 #17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,256

Applicant(s)

MISUMI ET AL.

Examiner

Luan Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10,11 and 17-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10,11 and 17-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office action is responsive to the amendment filed February 3, 2003.

Claims **10-11 and 17-24** are pending in this application.

Claims **1-9 and 12-16** have been canceled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claim **11** is rejected under 35 U.S.C. 102(e) as being anticipated by Hinkle et al. (6,072,228).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 11, Hinkle et al. (see specifically figures 6, 7a-7f, and 8-9) a sealed semiconductor device comprising: a semiconductor chip (44); a lead frame (48) including internal leads (54a and 58, see figure 6) extending across part of and spaced from a surface of the chip (see figures 7c-7e), a die pad (36) on which the semiconductor chip (44) is mounted, wherein the die pad (36) is

separated from and not connected to the lead frame (such as frame portions 50 and 56), the die pad (36) including fixed protrusions (38) extending toward and contacting and connected to the internal leads (58) (see figures 7d-7e-7f).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 10, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (5,198,883).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 10, 17 and 19, Takahashi et al. disclose (see specifically figures 1A-1B-1C-1D-1E) a semiconductor device comprising: a semiconductor chip (15); a lead frame (20) including internal leads (23 and 25), a plurality of the internal leads (25) extending across part of and spaced from a surface of the semiconductor chip (15), wherein internal leads (25) are electrically connected to bonding pads of the chip by bonding wires (Col. 1, lines 40+); a die pad (13) separate from and not connected to the lead frame (20) and on which the chip (15) is mounted, wherein internal lead (23) extends substantially perpendicular to and contacts the die pad (13) but does not contact the chip (15). Takahashi et al. further disclose the die pad (13) being substantially rectangular and including a

pair of longer sides and a pair of shorter sides and the internal lead (23) extending proximate the pair of shorter sides of the die pad (13). Takahashi et al. do not explicitly teach the device to be a sealed device.

Takahashi et al., however, do mention the sealing step for a semiconductor device (Col. 1, lines 14+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to seal the semiconductor device discussed above in order to protect the device from harmful environmental conditions.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (5,198,883) in view of Aoki (5,834,691 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 18, Takahashi et al. disclose all the limitations of the claimed invention as detailed above except for the protrusions extending proximate a pair of longer sides of the rectangular die pad. (Takahashi et al. disclose the protrusions extending proximate pair of shorter sides of the rectangular die pad).

Aoki while related to a similar lead-on-chip with die pad structure design teaches (see specifically figures 25c-25d) the protrusions (S) could extending proximate a pair of either shorter sides or longer sides of the rectangular die pad (D). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the die pad of Tomita et al.'s lead frame by forming

the protrusions extending proximate a pair of longer sides of the rectangular die pad instead of extending proximate a pair of shorter sides of the rectangular die pad, since such structure is conventional in the art, as taught by Aoki, and the modification is held to be within a general skill of a worker in the art.

6. Claim 20-24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami et al. (5,612,569) in view of Lee (5,358,906 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 20-24, Murakami et al. disclose (see specifically figures 47 and 5, 7, 11, 15) a sealed semiconductor device comprising: a semiconductor chip (1); a lead frame (3) (see Fig. 5) including internal leads (3A1) extending across part of and spaced from a surface of the chip, wherein the leads (3A1) are electrically connected with wires (5) to respective pads located approximately along a central axis of the chip; a die pad (e.g., the inner end portion of the lead 301c) on which chip (1) is mounted (see Fig. 47); a tape including four tape members (4) located at respective corners of the chip (1), each tape member (4) being disposed between the chip and some of internal leads (3A1), holding the chip and the internal leads at a fixed distance from each other (see Fig. 7), each of the tape members (4) having a first surface to which some of the internal leads (3A1) are bonded and fixed, and a second surface, in contact with but not adhered to the surface of the semiconductor chip (1) (see Fig. 7 and Col. 19, lines 33+); and an encapsulating resin (2A) sealing the semiconductor chip (1).

Murakami et al. fail to teach a portion of each tape member protruding beyond at least one edge of the surface of the semiconductor chip (1).

Lee while related to a similar lead-on-chip (LOC) design teaches tape member that bonds internal leads to a surface of a semiconductor chip and protrudes beyond an edge of the surface of the semiconductor chip (e.g., tape member 33 and die pad 34a in figure 3, tape member 53 and die pad 54a in figures 5 and 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Lee's teachings to Murakami et al.'s device by forming the tape member (4) to protrude beyond an edge of the surface of the semiconductor chip (1) in order to prevent the internal leads (3A1) from contacting the edge of the semiconductor chip (1).

Conclusion

7. Applicant's arguments with respect to claims **10-11** and **17-24** have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the changes in claims 10, 11, and 17-22 raise new issues that would require further consideration and/or search. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai
May 28, 2003



DAVID L. TALBOTT
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